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TEACHER'S GUIDE:

COMPANION TO

BARTHOLOMEW'S

PRIMARY-SCHOOL DRAWING-CARDS.

SERIES TWO.

FOR TEACHERS AND STUDENTS USING BARTHOLOMEW'S DRAWING-CARDS.

BY

MISS J. H. STICKNEY,
SUPERINTENDENT OF THE BOSTON TRAINING SCHOOL.

NEW YORK:
WOOLWORTH, AINSWORTH, AND COMPANY.
1872.

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INTRODUCTION.

In Series One, we have treated of straight lines in various positions, and entering into various forms. Series Two will present *curves*, and their use in representation. Since, in teaching, the power *to see* is first in importance and first in the order of time, the existence of the curve in nature and art should be developed by means of the many examples every schoolroom affords, then represented by lines upon the board.

As in case of straight lines, *formal definitions* should not be attempted. In many cases, some natural expression in words may assist the mind to form the conception intelligently, and aid the memory in recalling it; and technical words as helps to this end must be introduced, and carefully illustrated: but the instruction will miss its aim if attempt is made to render it scientific.

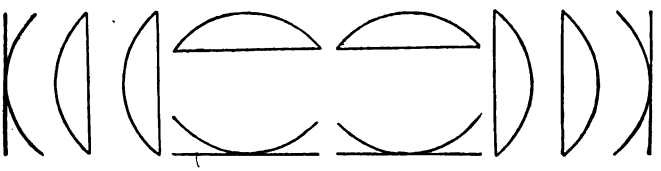
The arrangement of exercises in the successive lessons is so gradual as to require very little direction. The work is divided into two parts: the first composed of exercises and principles; the second, of the applica-

tion of these in representations of common objects. The aim is the same in all; viz., the idea of a symmetrical curve; ease, freedom, and positiveness in the execution; and such habits of class-work as will be serviceable in later teaching.

INSTRUCTIONS.

CARD I.

LESSON I.



ORDER of principal items in dictation: *—

1. Draw a horizontal line, a little less than an inch in length (first making points for its extremities).

2. Place a point in the middle of the line, and a second *above* the middle, at a little distance from it.

3. Starting at the point on the left, move the pencil several times in a curved line that shall pass through the upper point to the point at the right.

4. *Draw* the line through these points.

* The cards are intended as copies and guides to the children when practising by themselves. During the time of instruction, the teacher will find it better to hold the attention to *herself* and the *board*.

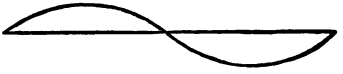
5. Examine the work of a few children, and illustrate upon the board the faults in their drawing, requiring the class to observe and criticise, first the illustrations, then their own work.

6. Repeat the dictation five or six times, that the children may learn it; then criticise their work, to mark improvement.

VARIETIES. — 1. For increased practice, both in straight and curved lines, make horizontal lines of equal length on the same level across the slate. Place points above the middle of each line; then, commencing on the left, draw the curves in succession. This will give a continuous motion of the hand in making the curves across the slate.

2. Repeat the same exercise, making the curves below the line.

3. Double the length of the guide-line, and make a curve above and below in a single line, thus: —



4. Make parallel horizontal lines; adding the curves as before.

5. By extending Variety 3, illustrate the wavy line; and, by combining with it Variety 4, give practice in drawing a series of *parallel wavy lines.*

6. Finally, omit the drawing of the guide-line, and draw the curves in their various positions, first placing the points.

The vertical lines and curves are next in order, and may be taken in the same way; and afterwards, if the children can take them, the oblique. For convenience in ditcation, the terms *concave* and *convex*, as descriptive of the relation of the curve to the guide-line, may be given by the teacher, and afterwards used by the class.

To draw the curves that are convex to the guide-line, a new dictation must be given. If the children have the cards, they will be able to study it out; and the exercise will thus not only develop language, but will become to them an order of thought which will be followed as a habit whenever they repeat the drawing. A great deal of practice may profitably be given to these elementary exercises. The patterns which follow will be only applications of them; and their whole beauty depends upon correct execution.

LESSON II.

The arrangement of the patterns upon this card will indicate the *order* to be pursued in teaching; and the degree of proficiency attained upon the exercises of the preceding lesson will determine the character and amount.

It is desirable that the pupils should not attempt the

last pattern, where sixteen curves meet at a point, until they can draw as many *separately*, whose proportions shall be uniform.

CARD II.

LESSON III.

DICTATION. — Draw first a short vertical guide-line; measure from its base to the left, a distance equal to one-half the line, and place a point; move the pencil, without drawing, from the *top* of the guide-line to this *point at the left*, first in a straight line, then in a curve that shall be *convex* to the vertical line; when this has been done, draw the line.

At the *right* of the guide-line, place a point on a level with, and at the same distance as, the point at the left; and draw the curve as before.

Draw a horizontal line, and, after marking points above and below either end, repeat the same figure in a horizontal position.

Combine these figures as in the right-hand pattern of Lesson III.

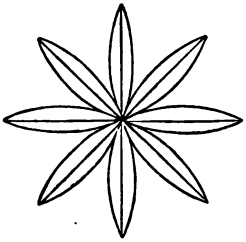
LESSON IV.

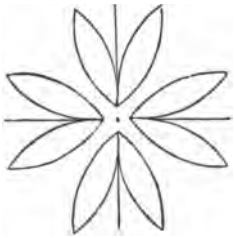
Repeat the preceding lesson, adding the concave curves as each part is drawn.

The application of these curves to symmetrical figures suggests the idea of *design*, — a lesson on which, at this point, will increase the practical interest in the

subject. Such a lesson will embrace the following points: —

These patterns are like those seen? — *in carpets, room-paper, fancy paper, prints and woollen fabrics, embossed table-covers, brilliants, damask table-linen, &c.** They were put there? — by the people who made these things, after having first been? — *designed* by some one. There are people who make it *their business* to invent pretty patterns. They must first be able to? — *draw very carefully.*





These patterns are sometimes of the *same color as the ground-work*, but *raised above it*, as in damask, brilliant, &c.; sometimes of *another color*, as in prints; sometimes of *gilt*, as in room-paper; sometimes *cut out*, as *iron gates, or ornaments of carved wood;* sometimes cut into shape, as in fancy candies.

The use of all these? — *their beauty;* if of few varieties, we should *weary of them:* there must be a *great*

* Italicized words express what must be drawn from the class by questions.

many; new ones must be frequently invented. All these are made of straight and curved lines, which the children know how to make: perhaps *they* can make some when they have learned to draw.

CARD III.

LESSONS V., VI.

In Lessons V. and VI., no new principle is added, but the patterns are a little more involved. The most speedy way of learning to draw them will be, first, to study them as they are drawn upon the card, making each pattern the subject of a lesson.

The elements of such study will embrace the following points: —

1. The kind of lines.

2. The relative length and position of the straight lines.

3. The number of circles, and their positions.

4. Where to commence to draw; each line being in turn dictated by some one of the class, and drawn by one on the board, while the others work upon their slates.

Very many other *sixteen-square* patterns may be invented by the children, with a few hints from the teacher. Those in the plates of Series One may be reviewed, substituting curves for many of the straight lines.

CARD IV.

LESSONS VII., VIII.

Lessons VII. and VIII. represent the completion of the idea, — that which every curve suggests, — the *perfect circle*, with the *oval* and *ellipse* as modifications of it. As one of the representative forms, the circle should be studied by the class before attempting the drawing.

The children have been dealing with lines, and will very naturally think the circle is a *line*. Questioning will develop this, and give the teacher an opportunity to show that it is not the line, but the *space* which the line *encloses*, as a garden is enclosed or bounded by a fence.

But the room or space might have some other shape, and then not be a circle.

So the *shape* of the space must be considered: and this is determined by the line that bounds it, as the shape of a garden by a fence; and we study the line to know about the circle.

First, questioning will draw from the children that it is a single line, with no indication of beginning or end, curved equally in all its parts.

To draw one, we sometimes use a string, of which one end is kept fixed, while the other, to which a crayon is attached, moves about, and makes the boundary, or *outline*, of the circle. The place of the fixed point we call the *centre*.

If the finger should slip upon the string, making it a little longer or shorter at any part, the figure formed would be somewhat like a circle, but not a perfect one; and if we have a figure, and wish to know whether or not it is a perfect circle, we measure from this centre to the line, and it is found to be a circle if the *distance is everywhere the same.*

So, gathering up what has been said, a circle is found to be? — *a space bounded by a line*, or enclosed by a line, *which is at every part at the same distance from the centre.*

The proper name of this curved line is the *circumference;* which means "going around," because it goes around the space.

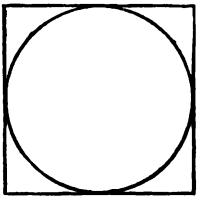
Rings or hoops, because shaped like a circle, are said to be circular (i.e., circle-shaped), though they have nothing to fill the space inside the circumference.

Examples of things that are circular may be given by the children, such as rims of cups, saucers, vases, plates, &c.; and circles may be found on surfaces of objects, as coins, tops of tables and stools, and ends of logs.

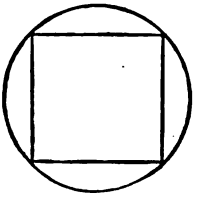
Lessons upon the sphere or globe should accompany this teaching, and the drawing of a globe shown to the class, and its outline noticed. The terms *arc*, *chord*, *diameter*, and *radius* may be used, if the class is advanced in language. If given, they will be useful to abbreviate dictations. See rules and definitions at the end of the book.

The cards will indicate the plan of teaching how to draw the circle. Attention must be given to the position of the hand, which influences the sweep of the line. A pair of dividers will be needed by the teacher in criticising the work. By the use of this inexpensive instrument, the pupils can themselves see any error made. This will be of far greater service to them than simply being told that an error has been made in this or that part of the drawing. Other practice may be given for variety.

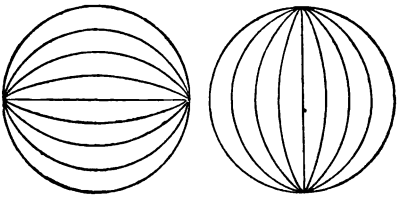
First, by drawing a square, finding its centre by diagonals, and inscribing a circle, as in the accompanying cut.



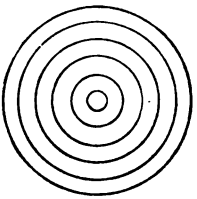
Second, by drawing the square for a guide, and a circumference outside it, as in the figure below.



Third, by drawing a guide-line, as in Lesson I., Card I., and marking distances above and below, or at the right and left, for curves.



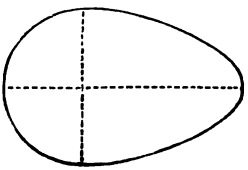
Fourth, by drawing parallel concentric circles, commencing with the smallest.



Fifth, by taking a centre and any given radius, and placing points which the circumference will pass through.

Sixth, by studying an arc drawn by the teacher, and judging where the centre would be, and so finishing the circle. Frequent blackboard practice should be given.

THE OVAL.



I. *Its Name.* — Call attention to the middle figure in Lesson X., Card V. What shall it be called? An *egg*. An *oval*. Who said the egg? *Is* this an egg? An egg is white; and this? — is black. A. may tell us something else about an egg. It has a shell, a yelk, and albumen, or white. Children, does this figure on the card tell you all this? What does it tell about the egg? Its shape. And so, since this is not an egg, but only like an egg in shape, instead of calling this the egg, what may we call it? Egg-shaped. Some one called it something else, — the oval. Yes: in the Latin language, from which a great many of our words came, *ovum* is the word for egg, and *ovale* for egg-shaped; and so we call this shape an OVAL. S., what does oval mean? The children may spell the word as it is being written upon the board.

II. *Its Shape.* — Now, to know what this shape really is, we must study an egg. F. may roll this one, and also the ball, or sphere, and tell me what she learns. G. may find the part of the egg most like a sphere; H., the part *least* like a sphere. I., what word did I give you for the *distance through* the sphere? The diameter.

You may find a diameter in this boiled egg with this knitting-needle. Who could find another way to measure a diameter? Yes: by holding the egg between two fingers, and then measuring the distance between the fingers when the egg is removed. Notice the

measure of M.'s diameter. Who sees a way to find a different diameter? What, then, do you learn about the diameters of the oval? *They are not all equal.* What was true about those of the sphere? They were equal. And so which rolls the better, — a figure with equal, or one with unequal diameters? Look at these slices of hard-boiled egg, and find circles; find figures like the one we are studying. What are the rest like? Like the next figure on the card.

How must we cut the egg to get slices shaped like the figure on the card, — the oval? From one end of the egg to the other. In the direction of which of the diameters? The longest. Show me the ends of the egg. Look at the two, and tell me the difference between them. One is more pointed than the other.

A. may take this lead-pencil, and *mark* a circumference beginning with the *pointed* end of the egg, and tell its shape. B. may mark a circumference which shall be a circle. C. another which shall be a circle. D. another, and now another. How are all these circles to each other? Parallel. Now we will try to tell what we have learned about the shape of the egg.

1. Do you find any *flat* or *plane* surface?

No: *it is curved everywhere.*

2. The sphere is curved everywhere: how does the curving differ?

The sphere curves equally everywhere, but the egg *unequally.*

3. Do you know a word that we have used to show that the two parts of any figure look well together, because of the same size or in opposite places?

Symmetrical.

See if this is so in the egg and in the oval.

4. Then what two words tell about the curving in the egg?

Unequal, but *symmetrical.*

5. What have we learned of the diameters of the egg?

They are of *different lengths.*

6. Find the ends of this egg, and tell me how they are unlike.

One is *more pointed* than the other.

III. *The Drawing.* — Hold an egg so that it shall show the class the same shape as the figure on the card. Find the slice which is most like this, and tell me how it was cut. Look at the drawing, and tell me the names of the different lines in it.

One is a circumference, the other two are diameters.

What kinds of lines? *The circumference is curved; the diameters are straight, — one horizontal, one vertical.*

Hold the egg in that position. Reverse it.

Of what use are the diameters in the drawing?

They are guide-lines, and their extremities give four prominent points in the circumference. How made? Dotted.

Notice how they compare with each other in length. Draw upon your slates a horizontal line an inch and a half in length.

Find a point in this line where the other diameter should cross it. How far is it from the ends of the line?

You may make it a half-inch from the end of the line on the left.

Who can tell how long to make this vertical diameter? Yes, an inch will be right: since no two eggs measure exactly the same, we cannot have *a rule* for all ovals.

Did you find any flat surface in the egg? Then, in drawing the circumference, no part of the line must be straight.

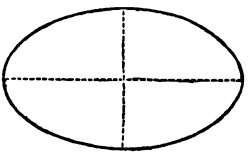
Describe the form of the large end of the oval? It is semi-circular.

All may draw this part of the oval.

Next, the upper part of the pointed end.

And now the lower part. We will criticise the work.

THE ELLIPSE.



Attention is directed to the last figure on the card. The corresponding solid, if in the possession of the

teacher, should be shown to the class. If this is not accessible, a stocking-ball, a lemon, or a Malaga grape, will answer the purpose, or a ball of yarn wound to represent it.

Let the children compare this solid with the sphere and oval, and tell its characteristics. Such answers as the following will be given: —

1. It curves everywhere.

2. The curving is unequal in different parts, but symmetrical.

3. The diameters are unequal: one is long, others shorter, as in the oval. The shortest pass through the middle point in the long diameter.

4. The most rapid curves are at these two ends.

5. In the figure on the card, the long diameter is nearly twice the length of the short one.

6. This figure on the card represents a slice, or section, made by cutting the ellipse in the direction of its long diameter.

Examples of this figure: Pictures and their frames, mirrors, dishes for the table, mats, and many other things are often in this form.

The children will have been accustomed to hear the terms oval and ellipse used as if interchangeable, and will need to be told that oval is a general term.

The *faults* that will occur in the practice of drawing the ellipse are of two classes, represented by the cuts

below. It will be found profitable to represent them upon the board, with the perfect one, as below, and number them, that the class may criticise their own work intelligently by means of them.

OBJECTS WHOSE APPARENT FORM IS ELLIPTICAL.

In the second part of this series, several objects occur of circular form or having circular rims; as, for example, the pail, tumbler, bowl, &c. All these are represented by elliptical forms, and must be drawn by the children, who cannot fail to observe the discrepancy between the actual form of the object and the drawing which represents it. Could this difficulty be once fully met, and the interest of the children excited, there would be very few objects of this kind they might not represent with an approach to accuracy.

The following lessons were arranged with this view, and given to children eight years of age, with as little difficulty as has usually been observed with older children, or even with adults. The points must, however, be followed, and the language chosen with great care.

The first idea to be appreciated by the children is, that, in drawing, objects are represented, *not in their*

actual form, — not as we know them to be, — but as they *appear* to us; but the children have never attempted to represent them, and the character of their apparent outlines is as new to them as their representation would be difficult. This second point must, therefore, be provided for before any real advance can be made in drawing.

If the teacher will take time for it, show one thing at a time, and keep what is gained in each lesson as a help to the next, the interest and success of the children will repay her study and patience; for eyes newly opened are very swift in discerning.

The first point to gain is in reference to *seeing* objects in different positions.

For this we have selected a common dust-basket. In cities, every school-building contains several; and, where they are not provided, something of similar form can be readily substituted.

The baskets are placed in different positions, — one upon the floor; one so as to be about as high as the

children themselves; and one as high as is possible above their heads.

It is impossible for all the children in a schoolroom to have at the same time the same view. Different classes of children must, therefore, be called from their seats to stand in a circle or semi-circle about the lowest of the objects, that the statement of one may be verified by the view of all. The higher ones need less care, and moving the object will suffice.

The objects are now examined, and the children questioned with reference to the amount of each that can be seen by them in the given position. Names given to the parts of the object will assist the children in telling what they see. Such questions as the following may be asked: —

1. Can you see *all* of the basket?

Tell me some part you *cannot see.* I will mark with chalk upon *this* part. Can you see the mark? Why not?

Tell me now all the parts that you *can see.*

2. Look at this second basket. Can you see more, or less, than of the first?

Is there any part that you see *now* that you did not see before?

Is any part *hidden* now that you then saw?

3. Study the third basket in the same way.

This may suffice for one lesson.

Next day, the teacher asks what was learned yesterday, and gets, perhaps, such an answer as the following: —

"We learned that we could see more of the basket in one place than in another."

"Yes," replies the teacher, "that is right. Now, did the basket look the same to you when it was *up above your head* as when it was on the floor *below you?* How many agree?

Should you have known that the baskets were the same, or, at any rate, *alike?* Yes.

Then in that way it looked the same; but did it look *exactly* the same in the two places? They all agree that it did not.

The teacher has a goblet of water: she lets a child come to her, and directs him to take it, and hold it carefully, so that the top shall be at the level of his own eyes, and to remember just how it appears; then to raise it as high as he can reach, and see if the appearance is the same; and, again, to lower it as it would be naturally held, and observe its appearance as before.*

This exercise will have given other children opportunity to see also, though not as well; but, after several have been allowed to do what the first has done, they

* The water in the goblet will help to insure steadiness, and the glistening surface of the water will attract the eye to the point of most importance.

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plane is at right angles to that of the outer, as is represented by the equator and outside meridian of a hemispherical map.* The class is reminded that the actual or real form is always circular, but that the *apparent* form is to be studied with reference to drawing.

Holding it so that the plane of the inner ring is at the level of some child's eye, she asks how the *outer* one appears; then how the inner one. If it is not seen to be like *a line across the outer one*, she lets a child take a pencil, and shows him how to hold it between his eye and the rings, so as to entirely *conceal* the inner

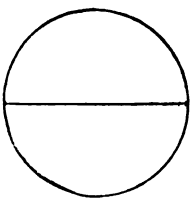


FIG. 1.

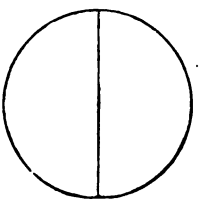


FIG. 2.

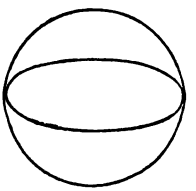


FIG. 3.

ring, as she holds it before him. Repeat this experiment with several children.

The outer circle is drawn, as a circle, upon the board, and a child sent to draw the inner one within it.

This idea, discovered and stated by a few, must become by observation the property of the whole. To test the intelligence, she turns the object in such a way

* In all these manipulations, the object must be held steadily and with reference to the *children's* eyes.

that the inner ring shall appear to be a *straight line* but not a *horizontal* one, and lets different children observe. The statement, "a circle sometimes looks like a straight line," may conclude the lesson.

The rings may be used again to illustrate a third appearance of the circle.

As a review, the children are called upon to hold the rings so that *both may appear in circular form;* then so that the outer one will appear circular and the inner *a line*, now vertical, now horizontal, and now oblique; and, again, so that the *inner* shall keep its circular appearance, and the *outer* change to represent the different straight lines.

Attention is now called to a different position of the inner circle, represented by Fig. 3.

For this illustration, it is held to represent a horizontal line, then gradually turned a little, so that the entire outline becomes visible; and the observer is asked if it resembles any figure he has ever learned about. If not, the teacher may direct him to measure with a pencil as in the preceding lesson. It is probable that the child will at once see the ellipse, and soon all the class will see it.

But now, to make the idea general, every object within reach having a circular top or rim must be impressed into service, and all the class exercised in

getting the three different views; viz., a circle *seen as a circle*, a circle *seen as a line*, and a circle *seen as an ellipse*. It will be enough for them to *say* of the top of the tumbler, the mug, dipper, wash-basin, vase, ink-stand, dust-basket, and the many things persevering interest will select, that, when held at the level of the eye in horizontal position, the circle is seen as, and should be represented in drawing by, a *straight line;* seen a little below the eye by an *ellipse;* and only as a *circle* when a line from the eye would make a right angle with the *plane* of the circle.* All the cards are now to be studied, those representing these ideas selected, and the position with respect to the eye of the artist stated by the children.

OBJECTS SEEN ABOVE THE EYE.

The final point in these lessons in elementary perspective has no illustration in this series of cards, but may be given where the interest of the class and teacher will warrant it.

A thin goblet may be held in the positions previously considered and finally studied, as seen when *above the eye.*

The top, being transparent, will show a complete

* The idea of the *plane of a circle* is new to the children, but can be easily explained by the teacher. See definitions in the Appendix.

ellipse, one-half of which is seen through the glass, but will be found to differ from those previously studied in this particular, — the half of the rim nearest the child will be the *upper* half of the ellipse, and the half most distant the *lower;* and circular objects not transparent will be found by them to show in this position the upper half of an ellipse, and so curve downward. Flower-pots suspended in windows, vases on high mantles, and objects of circular form above them, are seen in this manner. In case of the flower-pot, &c., the *bottom* of the object can be seen, and only one-half the rim of the top.

All these new points are liable to difficulty in schools where little has been done to promote intelligence. Teachers are urged first to make each point sure *for themselves*, by a careful study and many experiments: where they can walk confidently themselves, we are sure they may safely attempt to lead their classes, if the foregoing work has been well done. Our experience reminds us to caution them not to make the statements contained in these last lessons a matter of *memory*. The constant change of position and distance makes confusion; and no *remembered* answer will take the place of an intelligent observation and statement made at the time.

HAND AND ARM MOVEMENTS.

One other series of exercises will conclude this part of the book. They may be used as an *accompaniment*

to any lesson, or by themselves as an exercise. It is not necessary, even, that the slate should be free from other work of any kind; but pupils may be encouraged, before washing the slate for new work, to take the exercises here suggested, and cover the slate with horizontal and vertical lines.

EXERCISE 1. To introduce the exercise, direct the children to hold the pencil in the hand in the proper position, then to rest the hand upon the lower side of the frame of the slate *at the left*, and to move it, as if drawing, across this side of the frame to the right. This will insure a horizontal movement. For uniformity, count one for placing the hand and pencil at the left, and two for the movement across. This will keep the hand and pencil at right angles to the line, and give a steady, gradual movement *from the elbow*. When the movement is steady and sure, let the lines be drawn across the slate, the hand being nearer or farther from the body according to the position of the line. Fifty such lines may be drawn in a single lesson, or the distance apart may be greater, and practice given in parallels at equal distances.

EXERCISE 2. The right side of the children's bodies may next be turned a little towards the desk, and vertical lines drawn across the slate, keeping the same rules for the hand and arm, and the same angle of the line and pencil.

PART TWO.

THE lessons of Part Two present the application of previous ideas in the outlines of actual forms, with accompanying object-lessons for mental development.

The selection of examples embraces only such as are simple and definite in outline, and accessible to all. It is urged, that, in every case, the object represented, or something similar, shall be studied by the class. This is important for two reasons: first, that the correctness of the card shall be verified and appreciated; and, second, that the solidity of the object shall help the imagination in conceiving of a real object when reproducing the lines of the drawing. The frequent use of the names of parts, in the exercises in copying which follow the first instruction, will help to keep this conception vivid. In the lessons which follow, no attempt has been made, either in drawing or in object-teaching, to exhaust the resources of the cards; but only to suggest to the inexperienced, in either department, plans which have been tested, and points in each lesson which will prepare the way for the succeeding ones.

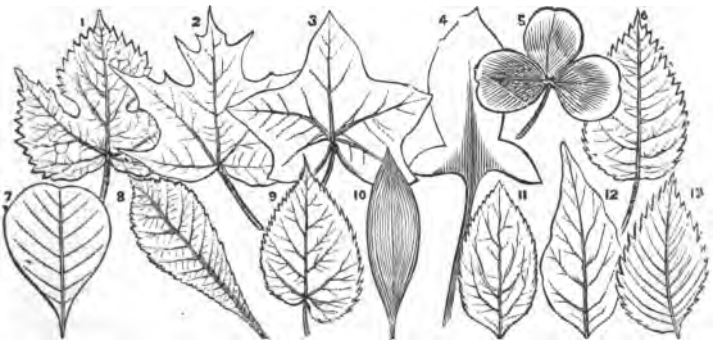
Each object will suggest *others*, only slightly altered, which may be introduced for increased practice. The readiness with which any failure may be erased, and

dismissed from memory, makes slate-drawing invite attempts which would not be warranted in a book.

As before, the style of address in the written instructions will be varied in the different lessons, or changed even in different parts of the same, as different ideas need more or less elaboration. There must, of necessity, be much of repetition in the actual teaching. This, so far as possible, will be omitted in the instructions.

CARD V.

LESSON IX.



1. Grape. 2. Maple. 3. English Ivy. 4. Sorrel. 5. Clover. 6. Rose. 7. Smoke-Tree. 8. Horse-Chestnut. 9. Linden, or Basswood. 10. Lily of the Valley. 11. Apple. 12. Ash. 13. Elm.

INTRODUCTORY OBJECT-LESSON.

1. Leaves are found upon the smallest plants, — on shrubs or bushes, and on all the trees. There are more than we can think, — multitudes on a single tree.

2. THEIR USE. — To the tree or bush they are *a beautiful dress*, made by the tree itself; and *lungs* also, *by which it breathes the pure air.*

They are also useful to us: some for their *pleasant odor*, as *balm*, *geranium*, *lavender;* some we like *to eat*, as *cabbage* and *spinach;* or to use as *medicine*, as the *herbs. Some kinds are eaten by cattle*, and many we like for their beauty.

3. THEIR SIZES AND SHAPES. — They differ very much in *size:* the smallest are hardly large enough to be seen, and the palm and others are often very large.

Their *forms* are also very unlike: those of corn and common grass are *long* and *narrow*, while others are nearly round; some are *oval*, some *heart-shaped*, &c. No two kinds of bush or tree have the *same* kind; and we may know the *different* plants by the shape of their leaves. Even on the same tree, it is said, no two are quite alike, as are no two people in the same family. The *edges* of some kinds are very pretty, — sometimes *entire*, or having one line; and sometimes *cut into points*, like the teeth of a saw, or *rounded* in little scallops.

4. THE PARTS OF A LEAF. — We find in most leaves a heavy stalk running from the base to the tip: it seems to be a part of the stem which joins the leaf to the branch, and is called the *midrib*. From it go out many smaller ones. They are called *veins;* and between

the veins are a great many little veins, or *veinlets.* Every leaf has also a green pulp and an outside skin; and we call the whole broad part the *blade.*

5. METHOD OF TEACHING what is contained in the last four paragraphs.

The *Italics* indicate what may be drawn from the children by skilful questioning, or what, if not known, should be taught them. The teacher should first provide herself with a few varieties of leaves; and, as each part of a leaf is noticed by one child, let others find it. Even when the pupils know very little of the subject, the questions of the teacher may draw from them answers which can be turned to good account. Questions which *suggest* the idea are not intended; nothing can be more injurious than such a habit to a teacher, or such an expectation of help as will be generated in a class. Often, some little device, like affecting not to know herself, will help the teacher in making the class try to think. Where observation can compass the difficulty, but *language* is wanting, a single word will often render all the assistance that is needed.

6. When all this has been done, and the children have collected leaves and pressed them nicely, the drawing may be commenced. They find those of the example to belong to the elm and willow trees, and draw those first.

What line shall be first drawn?

The midrib. It shows the length of the leaf, and is a guide for that of the edge of the blade.

The blade has two parts, one on either side of this line. In drawing, commence at the *tip* and draw the *left* side of the leaf, then go back again to the tip and draw the *right.** If the edge is to be notched or toothed, draw a guide-line for the general shape of the leaf, very lightly, then add the outlines of the edge as in the particular leaf studied. When this is done, add the *veins.* In the elm-leaf they go from the midrib on each side obliquely to the edge of the leaf in lines nearly parallel. In grass, corn, the lily of the valley, and others, all the veins run from the stem towards the tip.

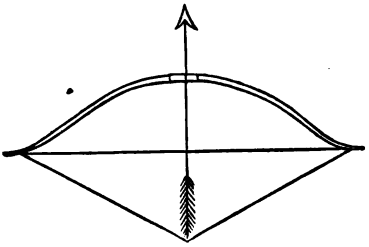
Notice in the elm-leaf the difference in the two sides of the blade at the base of the leaf, as one of its peculiarities.

Encourage the children to try *to learn the leaves of different trees and shrubs by their shapes*, and to draw them as a means of knowing them better.

* In the various positions in which the leaves may be placed in drawing from the actual leaf, adopt the same rules as are observed in drawing straight lines, viz.: If the direction is horizontal, or nearly so, draw from left to right: if vertical, or nearly so, from top to base.

LESSON X.

FIRST EXAMPLE, — THE BOW AND ARROW.



1. Its use. — *Questions.* — What is the first example in Lesson X?

Who has ever had a cross-bow of his own? How many have played with them?

Are they of use to children, *except as playthings?*

Do you know of any class of grown people who make use of them?

Summary of Answers. — The bow and arrow, or cross-bow, a toy or plaything for boys and girls. Its use gives healthful exercise as well as amusement.

The Indians use it in hunting and in their wars. The Swiss were formerly famous archers, i.e., arrow-shooters; and almost all nations, either for amusement, subsistence, or war, have, at some time, made use of the art.

In many countries, all the boys were formerly trained in archery at school, to help in making them ready for

service as soldiers. Some one is said to have saved his life by an arrow-shot! — story of William Tell.

2. Its Material and Structure. — *Questions.* — We will first study the bow. Of what is it made?

Will pine, or oak, or *any* kind of wood, make a good cross-bow?

If I gave you a piece of wood, how could you test it, to know if it was suitable? What must be true of wood used for making bows?

The Bow is made of *wood;* but not all kinds of wood are suitable. It must be of a kind that will *bend* and *not break*, and must be *elastic* enough to *spring back again.* Boys often make them of straight willow-boughs, — [they tell how, — process of tying the string explained]. The bow we are studying is bent into a somewhat curved form, so as to retain it always.

Describe the Arrow. — The Arrow is also of *wood,* — sometimes loaded with lead at one end. It is long and rounded. One end is called *the head:* it has a sharp point and two barbs. The other part is called the *shaft:* it sometimes has *feathers* upon it, as in the drawing. — Their use? To guide the arrow in a direct line.

Is there any other part? — Besides these two wooden parts, there is a *string* across the bow: when the arrow is not in use the string is like the horizontal line of the drawing; when ready to shoot, like the two oblique lines.

3. The Principle on Which it Depends. — Who can tell or show how to *use* the bow and arrow? The bow is held at the middle, in the left hand: the right hand holds the middle of the string and the arrow between the thumb and finger, till letting go the string suddenly sends the arrow into the air, or to some point called the *target.*

Questions. — Which of these three parts is it that seems to *send the arrow?* The string.

What does the string do? It flies back to its place.

What makes it fly back to its place? *The bent bow* is trying to spring back, and so pulls upon the string. Yes, it is the bow, and not the string, that springs, but the string that sends the arrow.

And now, what is it in the bow that makes it constantly try to get back again when it is bent? *The wood of which it is made is elastic.*

Recapitulation. — The bow and arrow have three parts, — a bow, made of flexible, elastic wood; a string, fastening the two ends; and an arrow with a head and shaft. The elasticity of the wood sends the arrow by drawing upon the string.

4. The Drawing.

Draw first a horizontal line about two inches in length.

Find the line which answers to it on the card.

What other straight lines can be seen?

Look at the vertical line, and tell what part of the

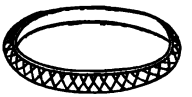
horizontal line it cuts. Mark this point in the horizontal line. Notice now the length of the shaft *above* the horizontal line. It is a little less than half the horizontal line. Place a point at this distance above the middle point. Find now the length of the shaft of the arrow *below* this guide-line. Is it less or more than the part above? Place a point. Draw now a vertical line for the shaft of the arrow. What is at the top of the shaft? What lines represent the head? Draw them.

Now observe the place where the bow crosses the arrow, and place a point. It is about half-way between the head of the arrow and the point where it is cut by the horizontal line. Study the *lines which represent the bow*. Where do they curve most? Where least? Commence at the *left* of the guide-line, and draw lightly the upper line in the half of the bow on the *left* of the arrow, then draw the half on the *right*. How do these two parts compare?

What do the double lines represent? Where has the bow the greatest width? Finish the bow.

What lines remain to be drawn? Of what kind are they all? Straight. Describe those of the shaft. Draw them. And now what lines remain? Draw the two parts of the string.

SECOND EXAMPLE, — THE FINGER-RING.



The difficulties of this drawing are perhaps greater than those of any lesson which has preceded it. It will be found almost impossible *to copy it*, line by line, and keep the likeness to a ring.

If the lesson on the perspective of the circle, on page 11, has been made plain, a child may understand its application to the ring as well as a grown person, and will have more patience with the necessary practice. Taken so, step by step, excellent discipline will be given, with constantly increasing accuracy.

We divide the lesson into two parts: first, the study of the ring in any position, and second, the representation of it in that selected for the card.

1. THE STUDY OF THE RING. — After a little talk of its use, material, value, &c., all who have rings are told to observe their shape, and tell how they should be drawn: this will readily recall the lesson referred to, and suggest the points to which attention is to be called.

They are first told to hold the rings near the eye, as if to look *through* them, and tell how they appear. The answer is, "like circles," or "circular." They remember that the circular rings could be so held as not to

appear to curve at all, but represent a straight line. This they illustrate with their rings, by holding them between the thumb and finger, and so as only to see the *width* of the ring. Turning the hand while holding the ring thus will show the different directions this straight line may take.

There was also another shape shown by the circle? The ellipse. They try to hold the ring so as to represent this too.*

The teacher places a ring upon a book, and the children hold the book so as to see the ring as a straight line; then, by lowering it very gradually, as an ellipse. Something of ring form should be observed in these two ways by every child before passing to a new point.

The drawing upon the card is now observed; and the children decide how the ring must have been placed when drawn for the example, and also which position makes the most desirable picture. This leads to a second point, which tells *how much is seen* in each of the different positions. Answers like the following may be obtained from the class by changing the position of the ring; and the exercise of telling what they observe will be of value to the children: —

1. I can see only *one of the edges.*
2. I can see *one-half the outside.*

* If this lesson upon the rings in Part I. seems to have been forgotten, it should be given again before going on with this point.

3. I can see *one-half the outside*, *one-half the inside*, all of *the upper edge*, and *half of the lower*.

The example upon the card is studied by the whole class, who tell the parts that are seen, and those that are hidden.

2. THE METHOD OF DRAWING A RING IN THE POSITION OF THAT OF THE CARD.—A little exercise in drawing the ellipse should be given before attempting to represent a ring; and a good preparation might be made by dictating an ellipse, then placing another directly under and parallel with it, as in Figure 1, or by making two vertical lines and marking points for parallel ellipses between them, as in Figure 2.

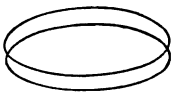


Figure 1.

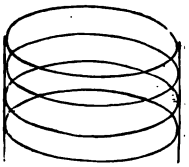
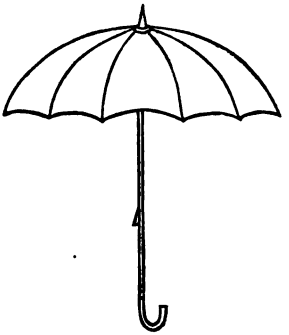


Figure 2.

When this is done, and the class commence to draw the ring, let the *upper edge* be taken first. This is an ellipse in appearance. The *lower edge* must be like it; and, although we do not see it all, we draw it, and afterward will erase what is hidden. The distance apart of these two will correspond to the width of the ring. Two vertical lines at the sides are added, and the drawing is complete. It represents a very thin ring, but not the

one of the copy. *Different rings* are talked about: some are of the same thickness throughout, others thin at the edge, but rounded out so as to be very thick in the middle, like that of the example. This shows most at the two sides; the teacher rounds her connecting lines upon the board, and lets the class observe and do the same with their own. Several rings are drawn: if of uniform thickness, the upper edge is made *double* or *heavy;* if of varying thickness, the lines that unite the two ellipses are *curved* as in the copy on the card. When other parts are well drawn, the ornamental lines are added by the children.

THIRD EXAMPLE, — THE UMBRELLA.



1. INTRODUCTION. — Summer day spoken of — many people walking and riding — suffered from what? — light and heat of sun.

Ladies often carry? — Parasols or sun-umbrellas.

Later in the day it rained very hard, then every one had? — Umbrellas.

THEIR USE? — To protect from rain when large; the smaller ones from the light and heat of the sun, which often causes sun-stroke, headache, or injury to the eyes. Without the large ones we should often spoil our clothing, or perhaps take colds and be very uncomfortable. There must have been a time when such a thing as the umbrella was unknown. It was invented by some one. Tell how the people laughed and hooted in London when the first one was seen. Impress upon them the great value of the invention.

3. STUDY OF THE INVENTION. — It is found to have two principal parts, — a *cover* of silk or cotton, stretched over a *frame.*

If it is to keep the rain from us, it must be waterproof; yet it is made of silk or cotton, like that used for other things. Why not of waterproof cloth or oiled silk? Its use must depend upon its shape, and upon its being *drawn so tightly* upon the frame.

The frame is made up of a great many pieces. There is, first, a long staff, finished at one end with a *knob* or *hook* to hold in the hand, and at the other with a *tip*, which, when we close the wet umbrella and carry it, lets the water drop from it, and which also prevents the wearing of the cloth.

From a part of the staff, near the tip, go out *eight*,

ten, or *twelve*, long pieces of whalebone or steel, called *ribs*, which are straight in a closed umbrella, but curved when it is open.

To make these ribs curve, and to hold them to the staff firmly, there are as many parts called *braces;* which are joined to the staff by a slide, which moves up and down, and to the ribs by *pivots* making a *hinge.* The ribs curve and become straight again because made of something elastic. The curved shape helps to let the water run down to the tips, and drop when the cover is very wet, instead of going through upon the person carrying the umbrella. By moving the slide we can close the umbrella, so as to have it ake little more room than a cane. How great the convenience of this!

To hold the slide, and so keep the umbrella securely shut or open, there are two wire *springs* in the staff. The cover is fitted to the frame, by being first cut in as many pieces as there are ribs, then sewed firmly, and fastened to the staff and the ribs.

The other parts are a *loop* and *button*, for use when the umbrella is closed.

METHOD OF TEACHING. — The teacher should provide herself with an umbrella, and encourage the children to find all its parts, and tell their uses. The design is, that, in all these lessons, *the children* shall furnish as much as is possible of the matter given. These points of description will often come in a fragmentary way;

and the teacher will do well at the close of the lesson to arrange the statements in concise form, so that it may be reproduced as a composition by means of such questions as the following: —

J. may tell why we use an umbrella, a sun-umbrella, or a parasol.

M., what different materials does an umbrella have?

S., name the two principal parts of an umbrella.

B., tell a part of the frame; A., another.

Who can tell them all? F. may do so.

The *use* of the *staff* — the *ribs?* — the *braces?* — the *pivots?* — the *slide?* — the *springs?* — the *knob* or *ring?* — the *cover?* — the *loop* and *button?*

When the card is studied for drawing, the lines should be dictated, that all the class may preserve the same order. The most natural order is: —

1st. The staff (leaving the part covered by the top of the umbrella to be erased afterward), with points marked upon it for the tip and the lower part of the cover.

2d. The two extreme points of the semi-circle described by the top.

3d. Four other points on a level with these at varying distances, as in the example.*

4th. Six curved lines for the ribs, drawn in their order from left to right.

* Let the children observe that the five parts of the cover, though of exactly the same size and shape in the actual form, are not so represented, and in the open umbrella do not so appear.

5th. Five other curves, joining the six tips for the edge of the cover.

6th. The hook at the end of the staff, and the double line of the staff.

7th. The band and spring.

When the open umbrella is well drawn, let the ingenuity of the class be exercised in drawing a closed one.

CARD VI.

The bowl, goblet, box, and pan are examples of objects presenting circular outlines; and the principal idea in the teaching should be the appearance of these in the position in which they are drawn. Until the ellipse is seen to be the natural representation of a circle when in a horizontal position, and below or above the level of the eye, the teacher must not be weary of repetition and new illustration. If kept interested till the idea becomes intelligent to them, the children will delight in sketching every thing they see, will see more accurately, and, having pleasure in this acquisition, will have courage to hope for success in new difficulties.

Let every child learn by the use of a pencil to measure the apparent length, breadth, and height of objects at varying distances, as a help to these and succeeding lessons.

LESSON XI.

THE BOWL AND GOBLET.

1. Comparison of the Two Objects. — What objects are represented in this lesson? The bowl and goblet. In what are they alike? Both have circular rims. What is true of the sides of both? They are curved. How are they unlike? The goblet is deeper than the bowl. Who can measure the depth of both?* What do you find? They are the same. But M. says the goblet is deeper; and I think he is right. Who will explain it? The goblet is smaller around, and therefore deeper in comparison with its circumference.

Look at the curved line that represents the outline of the sides and bottom of the bowl: what is its form? It is a semi- (or half-) circle. Find the corresponding line in the drawing of the goblet: what is *it* a half of? An ellipse.

What other difference between the bowl and goblet? The goblet has a part between the standard and the body, or bowl. We call such a part a *stem*. Observe the stem, and find another part. Describe it. Such a part is called a *bead*.

What do the double lines around the standard of the goblet show? The thickness of the glass.

2. The Position of the Objects. — Charles may

* Let the class use a card-measure.

hold this goblet so that he can see it as the artist saw the one represented on the card. The class may describe its position.

It is below the level of his eyes.

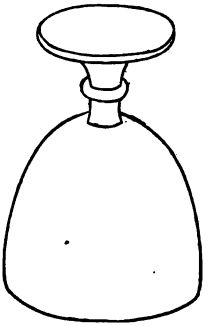
At what part do you look, Charles, to determine this? At the circular rim. How is it represented? As an ellipse. How does an ellipse differ from a circle? One of its diameters is shorter than the other. Show them that there may be any number of diameters in the circle or ellipse. We shall speak of but two in the ellipse, — the longest and the shortest. In this view of the goblet, how do these compare? The shortest is less than half the longest. Hold the goblet so as to give it this appearance. Measure with your pencil held before your eye, while I hold the goblet.

How is it in the drawing of the bowl? The short diameter is a little more than a quarter of the length of the other. [In drawing, insist upon accuracy in the length of the guide-lines.]

ADDITIONAL LESSON, — AN INVERTED GOBLET.

Exercise the judgment of the class by directing them to invert the card, and decide whether or not the second example correctly represents an *inverted* goblet. Reference to an actual goblet in this position, and below the eye, will develop the following statements: —

1. Looking down upon the inverted goblet, we shall



see the bottom, instead of the top of the base or standard, and the edge towards us will hide the place where the stem joins the base.

2. Only one-half of the inverted rim of the top will be seen, except it be dimly through the glass.

3. There will also be a difference in the proportions of the rim and base. The rim, being carried farther below the level of the eye, will approach more nearly a circular form than before; while the base, being higher, will be less like a circle; i.e., each will be wider or narrower, measured from front to rear, according to elevation.

If the teacher can draw the parts upon the board as she leads the children to see these things, and describe them, this will prove a most valuable lesson; and, after a little study and practice, they will draw the goblet equally well in either position. It is, however, a direct appeal to the intelligence of the class; and the teacher

can tell whether or not she can give it so clearly as to make it interesting. If not, she had best leave it until the review, when they will be better prepared for the exercise.

Vases of various styles may be taken now, either from the objects themselves, or as inventions of the teacher or children, and the idea given of the proportions in a symmetrical shape. For instruction in this, the teacher is referred to "Drawing Book and Guide No. 2 of Bartholomew's Series for Grammar Schools."

CARD VI.

LESSON XII.

FIRST EXAMPLE, — THE BOX.

QUESTIONS. — What is the first example in Lesson II.? The box.

It represents a *particular* box. Who can judge, from the drawing, of what it is made? — for what probable use? — how large? — containing how much?

Talk of the manufacture of such boxes, — the use, material, and expense.

SUMMARY OF ANSWERS. — The drawing represents a small wooden box, like those used for strawberries, &c. They are made by the help of machinery, of light, inexpensive wood, and sold very cheaply, for packing fruit,

and for holding any substances used in housekeeping, such as starch, soda, spices, &c.

STUDY OF THE BOX FOR DRAWING.* — Hold the box in different positions, and require the class to tell what parts can be seen. Let them tell what edges or outlines must be represented, wholly or in part, to make a correct drawing. Question in reference to the best position for the box, i.e., the one most natural for the object, and therefore making the best picture of it. They decide that it should be somewhat *below the level of the eye.* Refer to the example on the card: let one child observe the real box in the same relative position, and tell what parts he sees; others of the class finding corresponding parts on the card.

QUESTIONS. — Find a circular edge upon this box. How does a circle appear to the eye when seen in this position? †

Then what must be drawn to represent it? An ellipse. What part of the box will it represent? *The top of the box.* What other circular edges has the box? The edges of the rim and cover, the top of the box without the cover, and the bottom of the box. Which of these could not be seen, wholly or in part, in the draw-

* Do not fail to get such a box before giving the lesson.

† Be sure the class understand, that when we use the phrase, "appear to the eye," in this connection, we do not mean that the mind is deceived with regard to the actual form.

ing of a closed box? The top of the box without the cover.

It is better to learn to draw it by supposing it to be made of glass, or some transparent material, and drawing in each case the full ellipse. How many ellipses have we then for the drawing? Three. Find them.

How do the circles represented by these ellipses stand with respect to each other? They are parallel.

And when the box is placed as I now hold it, what is their position? They are horizontal.

Notice now their distance from each other. The middle one, or rim of the cover, must be nearer to the top than to the bottom.

Is there any other difference in these ellipses? Notice the *size*. That of the box is smaller than those of the cover. How much smaller? Only the thickness of the wood. We will first draw the upper ellipses in the top of the cover; then the upright sides of the cover, then the lower edge of the cover, as in the lesson on the finger-ring. After this, the upright sides of the box itself and the ellipse for the bottom.

[In drawing these elliptical forms, the guide-lines should in no case be omitted: they assist the eye, both in the execution and the criticism of the work, by showing it in parts which correspond with each other. These lines should be drawn lightly, not dotted, as, indeed, should all lines till the figure is fully sketched; then those which do not appear in the finished drawing may be easily erased, and those which remain marked over more heavily.]

The overlapping sides of the box, and the small circles which indicate the tacks which fasten them, are now described, and added to the drawing.

It is not designed that the children shall finish such a drawing in a single lesson, nor are the purposes of drawing best promoted in this way. Doing well as much as can be done, and giving additional intelligence and interest, are better, and will best advance the class.

The drawing of this box may be followed by sketches of other cylindrical boxes, either from memory or the boxes themselves. Muff-boxes, bonnet-boxes, and collar-boxes will give a variety in their relative proportions.

SECOND EXAMPLE, — THE PAN.

Let us suppose ourselves drawing from a real pan; you have seen them, have you not? I will see what you can tell me about one, — of what made; how large; and for what used.

Now, we will suppose ourselves to take the pan from the shelf to make a sketch of it. What is the first thing to do? To place it in position. Name the different positions of which you have learned. In which of these do such objects as the pan make the most natural picture?

What outlines will represent the pan? The upper rim, the lower rim, and the two sides.

What will represent the two rims in this position?

Two ellipses. How do they compare in size? The lower one is smaller. Draw a horizontal guide-line for the long diameter of the upper ellipse. Bisect it. Place points above and below the middle for the extremities of the short diameter. Before drawing this ellipse, see where the long diameter of the smaller one would fall. Draw it so that it shall pass through the lower point you have marked, one-half being on each side. See if it is of the right length. Draw now the two ellipses; making the width of the lower nearly the same, since it is a little farther below the eye, and smaller. What lines remain to be drawn? The side-lines. Of what kind are they? They are oblique. What relation do they bear to each other? They converge. See if there is any thing to erase. Tell me what part of a pan this drawing of yours shows. In giving the lesson, let one or two work at the board. When copying the example on the card, the rectangle should be used to fix definitely the proportions. Deeper pans, flower-pots, bakers' loaves, sugar loaves, glass jelly-jars, &c., are familiar examples of this form.

THIRD EXAMPLE, — THE DECANTER.

The decanter may have its side-lines almost endlessly varied, to represent the great number of bottles, large and small, and with necks of varying girth and length. After the guide-lines, finish the top; then mark points on op-

posite sides for the shoulders; draw the two sides, then the bottom. Making the two sides alike, which will result only from practice, constitutes the difficulty; and hence the chief value of this exercise.

CARD VII.

LESSON XIII.

FIRST EXAMPLE, — THE TUNNEL.

NOTHING new or difficult occurs in this example. As in the decanter, the guide for the convergence of the side-lines is a single line between them, and not two lines outside the drawing, as in the box and pan in Lesson 12: the reason for this change will be apparent, if the teacher or children try both ways. In drawing, let the horizontal and vertical guide-lines be drawn: this will block out the figure, as the rectangles did those of the box and pan. Next mark, either by points or a line, the apparent length of the short diameter, measured above and below the middle of the long diameter, and draw lightly the ellipse which represents the rim. Cut off on the vertical guide-line a part to represent the neck of the tunnel, by a horizontal line, which shall measure the width of the opening to the neck; draw the converging lines which represent its flaring sides, and the half of a small

ellipse which unites these lines. The outlines of the neck and ring will complete the drawing.

If drawn from dictation, there are twelve distinct acts, which, when their order is understood, may be given by counting.

SECOND EXAMPLE, — THE DIPPER.

The rolled edges of the dipper, and its handle, are the only new points. So much of review of past lessons as is needful may be given by the teacher, but need not be repeated here.

The two vertical lines, it will be observed, fall *within* the outer edge of the top, and *upon* the inner edge of the base.

In drawing the handle, begin with the *outer edge of the nearest side.* Require the class to trace that line, with the pencil, upon the card many times; then draw it lightly by itself, and afterwards find the place where this line joins the lines of the dipper, and add it to the drawing previously made.

The thickness of this edge is represented by a line parallel to the first, and at a little distance below it.

The width of the handle must now be considered. Make the children see, that, since the two sides of the handle are alike, this other edge, farther from them, is like the nearest one, but partly hidden by it; that the outside of the handle is seen at the top, and the in-

side below; that this farther one must cross the other two, and that the top of the handle is a little broader than the lower part. Let them trace this line upon the card as before, then add it to the drawing. For varieties, introduce the deep dipper, where the handle does not extend to the base of the dipper, and add handles on each side to vases like those previously drawn.

THIRD EXAMPLE, — THE PAIL.

The pail has flaring sides like the pan and tunnel, thickness of material represented like the dipper, and hoops or bands like the rim of the box. Besides these, it presents a bale and handle.

In drawing, block out the work by a lightly-drawn rectangle whose height is somewhat less than its width. The top of the rectangle is the long diameter of the ellipse which represents the top of the pail. Estimate the width of this ellipse: mark it, either by two points or by a vertical line; then draw it. Mark upon the base of the rectangle two points, at equal distances from the two ends, for the convergence of the side-lines, and draw the lines as in the tunnel. The ellipse which represents the bottom of the pail is next drawn, and the half that is to remain marked heavily.

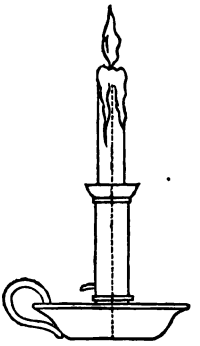
The hoops may be drawn, in cases like this, simply as lines parallel to others, near which they occur.

The bale and handle must be studied separately. Let the class observe the actual form of the top of the pail. It is circular.

The bale, if not bent to fix the position of the wooden shield or handle, would be circular too; when not in use, it lies on one side of the pail, and must therefore be a little larger than the pail itself. If resting so on the side towards the observer, it would appear to be elliptical; but, in the drawing, it stands upright, and faces the observer. A circle so seen is not foreshortened, that is, made to look narrower than it really is; and this bale represents a part of a circle in this vertical position, and therefore appears in its actual form. Show each of these statements to be true, if they cannot all be brought out by questions upon the appearance of the actual pail; then have the half-circle drawn by using the long diameter of the ellipse, lengthened a little at each end, for a measure, after which, the bending of the bale and the outlines of the shield are to be added.

LESSON XIV.

FIRST EXAMPLE, — THE CANDLE.



PRELIMINARY OBJECT LESSON. — Having directed the children to select this lesson, introduce the study of the first example, by getting from them statements telling the name and use of both candlestick and candle.

By picturing the places where they are sometimes seen, — in humble homes, far from cities and villages; also upon the mantles of elegant drawing-rooms, in silver and gold candelabras and candlesticks. Lead the children to decide which variety this represents. Talk of the different substances used for making both, according to use; and the children will conclude that this is a *common brass or iron candlestick, holding a spermaceti or tallow candle.*

Examination of the copy will show the parts of a can-

dlestick, — a *standard*, *handle*, *band*, *slide*, *shaft*, and *cup*. These the children find, and name: telling in each case the use; e.g., the cup at the top to hold any of the melted tallow which may run down the candle; the slide to raise the candle, so that the part now inside the shaft may not be wasted; the standard to make a broad base to stand upon; and the handle for use in carrying about.

Study of the candle (a real one, if possible) discovers *tallow* and *wick*, the latter running through the centre from end to end; and the processes of moulding and dipping, with the qualities of the tallow and wicking, are considered.

The drawing also represents *a flame*. The children must be made to reason out the process of burning. The wick, being highly inflammable, lights quickly and burns rapidly: it would soon be burned out, but that it is locked up so closely in the centre of the tallow that it can only burn by melting that, as fast as it can be used, and burning both.

Comparison of the flames of cotton, shavings, or any light material, with those of coal, oil, &c., will show that the latter is strong, steady, and reliable; so it is the flame made by the melted tallow that we want; and the wick is only a conductor of the oil, which could not burn without it.

Again, the candle is made round, and not square or

irregular, because the heat of the burning wick can only reach a little way in all directions; and, if any tallow were farther from it, it would not melt in time, and so the candle would not burn evenly.

Question the children about the advantages of candles, the occasions when more safe, portable, and economical than lamps. Show the little open cup formed at the top of a burning candle, containing a few drops of oil, and the possibility that its thin wall will give way, and allow an overflow, if either the flame is very hot, or the candlestick is held carelessly. Question what might happen then, and show how, by its cooling quickly, we are saved in most cases from injury.

THE DRAWING.

Take the drawing in parts: —

1st. The standard, with its handle.

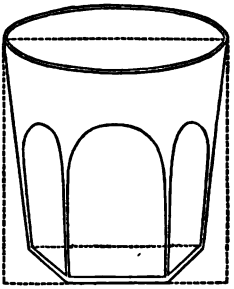
2d. The whole candlestick.

3d. The candle new, and unlighted.

4th. The candlestick, lighted and partly burned candle, with melted tallow upon the sides.

An additional object-lesson may be given upon an oil-lamp, and its method of burning; and a kind of lamp drawn by each child from his own conception of their forms.

SECOND EXAMPLE, — THE TUMBLER.



THE top and sides of the tumbler will present no difficulties. It is better, in so familiar an example, to call attention at once to the new idea.

They have all seen the smooth, round tumbler: this one differs, in having six flat or plane surfaces, oval-shaped at the top, and making the bottom of the tumbler hexagonal.*

In a tumbler, these plane-surfaces, commonly called flutings, are of equal size, and of the same shape; and their inequality in the drawing must be accounted for, although the full explanation of fore-shortening is too difficult for them at this time.

It may be sufficient to show, that the hexagonal base in this position, like the circular one, appears to the eye to be narrower from front to rear than from side to side,

* If there have been no lessons on the different regular polygons, this word must be explained, illustrated, and taught at this time.

and that the side nearest the eye presents a *front* view, and hence appears as it is, while those which recede appear shorter than they are. Drawing the hexagon *within an ellipse* will prepare them for appreciating this point. The two side-flutings must be carefully studied to be reproduced. It may be well to draw lightly a curved line parallel, or slightly converging with the rim, at the height for these flutings which would touch them at their highest point. The middle one should be first drawn, then the two others made alike, but in reversed positions; the curve on one side of each being more rounded than that on the other.

Comparison of a tumbler and goblet will suggest the absence of a foot or standard; and the class may be told that formerly these tumblers were pointed at the bottom, and so would not stand, which gave them their name, "tumblers."

THIRD EXAMPLE, — THE PITCHER.

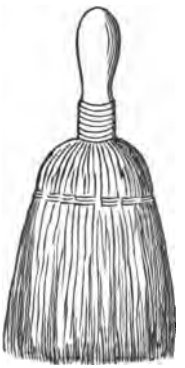
LIKE the decanter, this subject presents irregular though symmetrical outlines, which vary in the different varieties. The great point in drawing it is to have the two sides alike; which can only result from practice. The example presents another new feature, which the class should search to discover. The others have represented objects below the level of the eye; while in this

the base is below the level of the eye, and the top above it, the point opposite the eye falling nearly midway between. The pitcher would be too difficult a subject for them if seen in any other position.

CARD VIII.

LESSON XV.

FIRST EXAMPLE, — THE BRUSH-BROOM.



ITS USE AND NAME. — Look at the first example in this lesson.

Who can tell me what we do with such an object?

ANSWERS. — We brush our cloaks, coats, dresses; brush out the dust from stuffed furniture, from the stair-carpet, &c.

What one word tells us what it does? It *brushes*.

Yes: it is not really a brush, but it does the work of one.

Now, who can think of something else it is somewhat like? Yes, a broom; but in what way like a broom? It is made of the same things. What things? The broom-part is so called from the plant of that name from which we obtain it. Name *all* the materials used in making this and the broom.

Wood, wire, twine, and broom.

Then it does the work of a brush, and has the same materials as the broom: what might we therefore call it? The brush-broom, or the broom-brush? Who can tell me now why we call it by one of these names?

Its Construction. — Having all the parts, what would you do first, if you had to make a broom?

Lay the twigs around the handle, and fasten by winding the wire around.

What shape will the broom have then? It will be round. Yes, would it not be better to have it so? Why not? I have seen a round broom-brush.

No, you are right: it would *not* be as well in so large a brush. Can you think of a reason?

It must be broad, to take a great deal of dust at a time; and, if as thick as broad, would be clumsy and tiresome to use because stiff, and would needlessly wear out our clothing or carpets. Can you tell me any places that would not get brushed thoroughly if the brush were

At the two sides for the width of the broom at the bottom.

I will first name these, and you may look at the card to see if you know where they are to be; and then dictate them for you to draw.

2. Which outline must be drawn first? That of the handle. Draw it from the top in two parts. Be sure they are of the same size.

The wire comes next. It is wound around in circles: look and see how they are represented.

The stitches of the twine are next in order: look carefully at the card as you draw.

Now add the outlines of the shoulders; then the sides of the broom. Compare your work with the card, and correct any thing that is wrong. What remains to be drawn? Each little twig. Look again at the card. Notice that many of the lines are short, while the twigs themselves are all of the same length. We will finish this drawing by making our lines long like the twigs themselves, then see if it is a more natural picture, — a more correct likeness of the broom. We find it is not. Try again, drawing them like the example on the card. It will be worth a great deal of trying, to be able to do them well.

SECOND EXAMPLE, — THE HAMMER AND MALLET.

Question about their uses, the materials that compose them, and their value.

Get the names *handle* and *head* for parts of both; also *claw* for the pointed end of the head of the hammer, and *eye* for the part that receives the handle. Let the class study out the guide-lines as in the last example.

LESSON XVI.

FIRST EXAMPLE, — THE KNIFE.

DRAW the knife of the card carefully, line by line, in the following order; then let the children sketch any knife they may chance to have or remember.

1. That which represents the nearest upper edge of the handle.
2. The lower edge of the handle.
3. The curved line that unites lines 1 and 2.
4. The other end of the handle.
5. The lines of the tips of metal which add strength and beauty to the handle.
6. The farthest edge of the handle, making the groove for the blade.
7. The back of the blade.
8. The shoulder of the blade.
9. The edge.
10. The notch for opening the knife.
11. The rivets of the handle.

SECOND EXAMPLE, — THE SLED.*

Excellent preparation for perspective drawing may be given very simply in this lesson by following the lead of such questions and suggestions as the following: —

Does this look like any sled you have seen?

Show with your two hands how wide you think such a sled is.

They conclude upon two and a half feet, perhaps, for length, and a little more than a foot in breadth, with runners five or six inches high.

When these proportions are fixed in the minds of the children, direct attention again to the drawing, and inquire if it represents such a sled. They will agree, for the most part, that it does.

Show them now a drawing of the sled, or a paper cut to represent the outlines, and let them fold the paper along the line marked in the example of the card, EF, so as to observe the top of the sled by itself, with the runner at right angles to it, as in the sled itself. They will be surprised at the narrowness of the top compared with both the *length* of the sled and the *height* of the runner. Call attention to the measurement of the ex-

* If the teacher has had no training in drawing, she will find it an advantage to prepare herself in elementary perspective by taking Nos. 3 and 4 of Bartholomew's Drawing Books, with their accompanying Guides, and going carefully through them, drawing each example upon the board or or upon paper.

ample of the card. The distance AE, or DF, is exactly the same as the distance EB, or FC.

Is the drawing therefore wrong? Were the estimates of the width of the top wrong? and is the width in a real sled just the same as the height of the runners, instead of being more than twice as great? They do not know.

If there is doubt in reference to the drawing, put one upon the board in which the top *shall* be more than double the height of the runner, and let the class compare the two.

Tell them that the drawing is correct, and that it *does* represent just such a sled as they have described; but that the top of the sled, when looked upon in this way, appears narrower than it actually is; that is, it is foreshortened, just as the circle is. The full explanation of this fact is too abstract for children at this age; but they may see it illustrated as a fact, long before they can comprehend it as a principle.

THE DRAWING.—Have the guide-lines lightly drawn, in their exact relative proportions, — the line AB being a little less than a quarter of the length of AD; and AE and EB equal.

Draw from E the lower edge of the runner, first placing points for the extremities of the straight line.

Also from E, the nearest side of the top, ending where the line begins to curve for the back.

The third line is the curve for the back of the runner, ending halfway between D and F.

The farther edge of the top comes next, with the curve for the back; then the string, the part that is seen of the lower edge of the farther runner, the fastenings, &c.

CARD IX.

LESSONS XVII. AND XVIII.

HOUSES.

REVIEW the lesson upon a house given in Series One, and let the class tell what is represented in the examples on the card; then turn to the four examples of this series, and inquire how much more can be seen.

The bricks and mortar of the chimneys are suggested, and their uses in building discussed; the clapboards upon the sides, the slates or shingles whose edges appear at the edges of the roofs, and the trimmings and ornaments, are found and named; the trellis-work and porch of one, the latch and hinges upon the door of another, and the fences, window-frames, and sashes, are talked about, and their uses developed.

In addition, question upon the varieties of houses. Get such names as villa, cottage, mansion, &c.

This leads to the consideration of the number of stories

in a house of each kind. One example on the card represents two, the others only one story.

Different roofs also give variety. The common roof, the French, Mansard, gamble, and hip are the best known.

Beauty and convenience are also promoted by bay-windows, porticoes, verandas, cupolas, &c.

In connection with the examples of the card, exercise imagination in picturing the sides of the houses not here represented, with the number of rooms, &c. Let the children also make drawings of the front, back, or sides of their own houses.

In drawing, the lettered points and the previous instruction will indicate the order of the lines, which should be carefully learned from the card before the children begin to draw.

In the next series, two sides of a house will be represented, and elementary perspective explained.

APPENDIX.

ANALYSIS OF THE WRITTEN ALPHABET.

1. The slanting straight line, made by a downward movement, is required in twenty-two of the twenty-six small letters; that is, in all except *c*, *e*, *o*, *s*.

2. There are six principles, so called, by the union and connection of which, with the aid of a few exceptional forms, all the small letters are made.

3. The ***First Principle*** is best seen in the last part of *u*. It consists of the slanting straight line, the turn, and the connecting line, — the latter to be carried to the same height as the straight line, with more slant. The width of this principle at the top should be a little less than the vertical height. The letter *u* is formed from the First Principle written twice, the right curve being written as a connecting line before it.

The letter *i* is the First Principle preceded by the right curve or connecting, as in *u*. A small dot must be placed over it, the height of the letter above it, and on the slant of the main line. The straight line, downward curves, and ovals are main lines.

4. The ***Second Principle*** is the first part of *n*. To write it, carry the left curve to the top-line; for directions in reference to these lines, see "Instruction in Writing" (p. 69), go well over at the top, and make a slight bend to complete the turn, and descend straight and slanting.

NOTE. — The fault to be guarded against is the not carrying the

up stroke far enough over at the top, thus making the turn vertical instead of oblique.

5. The ***Third Principle*** is the last part of *n*. It begins like the Second Principle, and not like the First; in fact, it is the union of these in the straight line. The letters *m* and *n* are formed from the Second and Third Principles.

The letter *x* is the Third Principle, crossed through the middle by a slanting straight line. The letter *v* is formed from the Third Principle, slightly modified by carrying the last up stroke closer, at the top, to the main line, then returning on it a very short distance for the dot, or bulb, and adding a horizontal connecting line. The first part of *w* is the Third Principle, modified as in *v*; the last part is the First Principle, modified in like manner, and finished like *v*.

The letter *o* is an oval: the left curve is used for the first connecting line, and a horizontal curve for the last. Take care that the *o* is made narrow on the main slant, and that the curves are similar, though reversed.

6. The first part of *a* is the ***Fourth Principle***. It is written by carrying the left curve over as far as the second point of a *u*, then retracing, and, descending with a long curve, then making a narrow turn, and running up directly to meet the upper end of the first line. To complete the *a*, add the First Principle.

NOTE. — The most common faults in writing the Fourth Principle are, not carrying the first line far enough forward, and dropping it down at the end; turning too soon, and sagging at the right side of the turn; and making the main line of the First Principle run down on the up-stroke of the Fourth, whereas it should join it at the top only.

The letter *c* is formed from the left side of *o*. Begin as in *n*, with the left curve; make the turn, and begin the straight line; stop short; retrace, and descend with the left side of the oval; make a narrow turn, and finish with the right curve.

NOTE. — Take care that the nose is not too long; that it does not project instead of being on the downward slant; that the oval part

is not too much rounded, nor turned too soon, and that the turn is not too broad.

The letter *e* is also formed from the left side of *o*. The right curve is used for a connecting line: this crosses the left side of the oval at one-third of its height, and unites with it at the top.

The letter *r* is formed by the right curve carried a little above the top-line, returning on it a very short distance to form a dot, or bulb, dropping a short, vertical, straight line, and finishing with the First Principle.

NOTE. — Take care that the dot and the vertical straight line are not too long, and that the downward stroke of the First Principle has the proper slant.

The letter *s* begins like *r*, with the right curve carried a little above the line: this is retraced to the line. A delicate swell, the right side of an *o*, descends, turns, and ascends on the left side like an *o*; this is retraced for the dot, or bulb, and, after leaving the bottom of the turn, ascends with the right curve for a connecting line.

This disposes of thirteen of the letters formed from the first four principles.

NOTE. — Do not allow the pencil to be raised until the word is finished.

The *stem* letters are *t*, *d*, *p*, and *q* (see Card XI., Lesson XXII). The height of *u* is called a *space*. These letters are two spaces high above the base-line. The stems of *p* and *q* are two spaces below the base-line.

The letter *t* is the First Principle extended. The slant of the connecting line must be changed at the height of one space, so that the down-stroke may descend on it with the down-slant.

The letter *d* is formed from the Fourth Principle and First extended.

For the letter *p*, the connecting line must be written with less slant than usual, because it joins the stem so high up. The stem is a straight line, four spaces long: the pencil should be raised at the bottom of it. Beginning again at the point where it crosses the base-line, the Third Principle is added.

The letter *q* begins, like *a* and *d*, with the Fourth Principle. The stem is a straight line, three spaces long, turned forward at the bottom, and finished by the left curve making a narrow fold, and branching off at the base-line.

7. The ***Fifth Principle*** is the first part of *h*. To write it, begin with the right curve, with the usual up-slant: lessen the slant at the height of one space. Carry it up three spaces from the base-line, make a narrow turn, descend with a very slight left curve to cross the up-stroke at the height of one space; then finish straight to the base-line.

For *l*, turn and finish like the First Principle.

For *b*, turn and finish like *v*.

For *h*, add the Third Principle without turning.

For *k*, carry up the first line of the Third Principle closer to the looped stem and one-third of a space higher than usual: make a loop; then descend as in *h*.

8. The ***Sixth Principle*** is the last part of *y*. To write it, begin at the top-line, that is one space above the base-line, and descend to it with a slanting straight line; then curve very slightly to the right through two spaces: turn, and ascend with the left curve to cross at the base-line, from which point the left curve is carried with increased slant to the top-line.

For *j*, begin with right curve for connecting line, and place a dot over the Principle, as in *i*.

For *y*, begin with the Third Principle.

For *g*, write the Second Principle, and, by a small shoulder, join it to the loop of the Sixth Principle.

The letter *f* has a fold below peculiar to itself. The upper part is the Sixth Principle. Continue this in a straight line; turn, and ascend with the right curve, crossing at the base-line, and finish with a horizontal curve. It extends two spaces below the base-line.

The small letters should be thoroughly learned, and executed with ease and accuracy, before commencing the capitals.

THE CAPITALS.

9. Three Principles are used in writing the capitals; viz., the Capital Stem, or Seventh; the Direct Oval, or Eighth; and the Indirect Oval, or Ninth.

10. The ***Seventh Principle*** is the Capital Stem, as in *T*. It is a double curve, or "line of beauty," begun at the top, and written downwards, and finished with an oval half the height of the letter.

Observe the slight curve of the upper part in *A*, *N*, *M*, and the increased slant with which it is written in these letters. In *H* and *K*, it is half a space, and in *G* one space shorter than usual. In *T* and *F*, the tops must not touch the stem.

11. The ***Eighth Principle*** is the Direct Oval, the capital *O*. Notice the varieties of this in *D*, *E*, *C*, and the finish of *X*. The width equals half the length.

12. The ***Ninth Principle*** is the Indirect Oval, as in the first part of *W*. Its width is half its length; and it occupies two-thirds of the height of the letters in which it occurs.

The capitals should be written in the four horizontal lines, marking three equal spaces mentioned above. The *J*, *Y*, and *Z* descend two spaces below.

13. ***A, N, M.*** Begin these letters at the top. Give full slant to the first line. Let the upper line of the oval finish curve exactly like the lower. Across the middle of *N*, two equal widths, of *M* three equal widths, are required.

14. ***T, F.*** See § 10. Make a deep, narrow, inverted oval to begin the top, and then a double curve.

15. ***H, K.*** Let the first part be only three-fourths the height of the letter. Begin the first down-stroke straight, and then carry it well under for the oval. In *K*, let the middle loop of the second part pass round the stem at one-third from the top, and slant upwards, towards the left.

16. ***S, L.*** Slant as usual, with right curve to half the height of the letter: then lessen the slant to the top; turn, and descend with a

similar curve, to cross at the middle; there change to the right curve, and finish with an oval half the height.

17. ***I, J.*** Take care to keep the last up-stroke of the head well up. Descend with straight line through the centre of the little loop, which is the base of the head; run under, and finish with the oval in *I*; descend, and finish with Sixth Principle in *J*.

18. ***P, B, R.*** Give a slight increase of slant to the stem; mind the full lower turn; round the curve well up in front: when the highest point in front of the stem is reached, descend at once. Finish *P* at half its height. In *B*, make a loop pointing upwards, towards the left, passing round the stem at half the height, and finish with a curve descending a little below the base-line, and carried up to within half the height.

19. ***G.*** Write the first line as in *S*, § 16. Form a loop, and let the bottom of the turn be one space from the base-line; ascend to half the height of the loop: make the stem with a double curve, and finish with an oval.

20. ***O.*** Let both sides be well curved, and make a full turn at the base and top. The distance between the left curves is one-fourth of the whole width.

21. ***D.*** Be sure to touch the base-line on the right side of the crossing; make the back narrow, and carry the line well up in front: finish with Eighth Principle.

22. ***E.*** The head should be exactly over the middle of the lower oval. The little loop should point downwards towards the right.

23. ***C.*** Begin as in *S*, § 16. Finish with a direct oval, half the height of the letter.

24. ***X, Z, Q, W, V, Y, U.*** Begin these letters with the Ninth Principle (see § 12). Make the left side of *X* first. In *Z*, join the Ninth Principle to the Sixth by a loop resting on the base-line. In *Q*, be sure and touch the base-line on the right side of the crossing. Across the middle of *W*, let there be three equal widths. In *V*, do not let the last up-stroke slant too much: it ends one-third from the top of the letter. Finish *Y* with a straight line and loop: mind the width of *Y* and *U*.

CARDS X., XI., AND XII.

WRITING. — Card X. is a repetition of Lessons 22 and 23 of Series One. The single letters are again introduced for extended practice in describing and copying. The card should be always at hand for reference during other exercises in Writing, until the characteristics of each letter are perfectly familiar.

In the remaining lessons, all the small letters are many times repeated in various connections, to teach the method of combining into words; and the capitals occur as initial letters. The subjoined Appendix gives a full analysis of each.

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